



Fueling California's Economy

Through business and community partnerships, LLNL's science, technology, and engineering positively impact the state's economy.

LLNL's Economic Impact

Lawrence Livermore National Laboratory (LLNL), located in Livermore, California, is a research and development facility for science and technology solutions to some of our nation's greatest challenges. Managed by Lawrence Livermore National Security, LLC, (LLNS). LLNL has an annual budget of \$2.1 billion, and 6,800 LLNS employees. It is largely funded by the Department of Energy's National Nuclear Security Administration.

LLNL's economic impact in California manifests itself directly through its payroll to its employees, and through procurements awarded to companies operating within the state. The Laboratory stimulates commercial activity through the transfer of its technologies to licensees ranging from startups to established companies. LLNL also develops research-based public-private partnerships to improve business access to world-class scientific capabilities to help them improve their technologies.

In Fiscal Year 2018, LLNL awarded more than \$730 million in procurements to businesses, both in California and across the nation, for a broad range of products and services that support the Laboratory's overall mission. California awards topped \$248 million. In addition, the Laboratory workforce's more than \$892 million payroll base, directly contributes to the regional economy.

California Success Stories

POC Medical Systems: POC Medical Systems Inc. recently raised \$21 million in Series A funding for clinical beta testing and initial commercialization of a rapid, portable breast cancer screening test known as MammoAlert™, which is based on LLNL technology.

Bio-Rad: LLNL scientists co-founded QuantaLife, which commercialized LLNL's anti-bioterrorism detector technology into genetic screening tools that use an oil emulsion to atomize one sample into thousands of equivalent nanoliter droplets. Bio-Rad Laboratories acquired QuantaLife in 2011.

SafeTraces, Inc.: The annual cost of foodborne diseases in the U.S. is estimated at \$150 billion. Startup SafeTraces, Inc. aims to reduce food safety concerns such as contaminated and counterfeit food. It licensed a DNA-based barcode technology developed at LLNL that has applications ranging from securing the food supply chain, to tracing the outbreak of foodborne illness to its source in minutes.

Google X: A technology developed at LLNL may help bring high-speed wireless internet access to rural and remote locations across the globe. The technology moved to a startup acquired by GoogleX, which plans to provide worldwide internet access using free space optical communications (FSOC), where lasers deliver fast, reliable long-distance connectivity, similar to a fiber optic cable, but without the cable.

FY2018 LLNL BAY AREA PROCUREMENTS



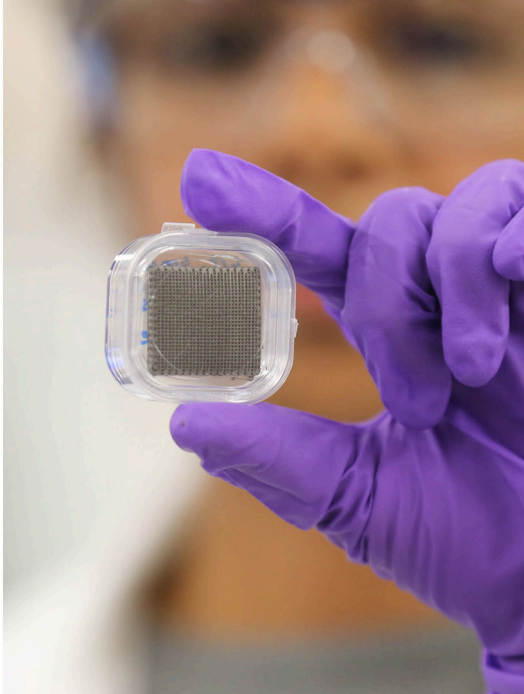
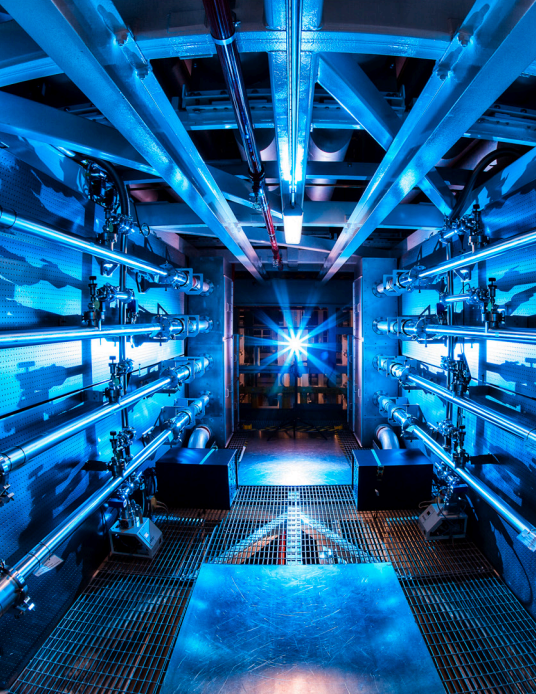
\$248 M

CA PROCUREMENT AWARDS

\$730 M

TOTAL PROCUREMENT AWARDS

- **106** companies with active commercial licenses, **53** based in California
- Over **\$1.4B** of products with "LLNL Inside" were sold in the past 5 years



LLNL as a Business Partner

The Laboratory is focused on innovation initiatives that will develop public/private partnerships and grow high-technology business opportunities in the Tri-Valley and greater San Francisco Bay region. Furthering these goals are LLNL's relationships with regional organizations such as the California Clean Energy Fund, the Bay Area Council, East Bay Economic Development Alliance, Silicon Valley Leadership Group, and the Innovation Tri-Valley Leadership Group.

LLNL's Innovation and Partnerships Office (IPO) serves as a focal point for the Lab's engagement with industry. Whether through technology commercialization, encouraging entrepreneurship, or business development activities, the primary mission is to grow the economy by advancing the development and commercialization of scientific discoveries.

IPO has active commercial licenses with 106 companies as well as dozens of active cooperative research and development agreements (CRADAs). Licensing and royalty income in recent years has topped \$8 million annually, representing more than \$300 million in annual sales of products based on LLNL technologies. LLNL-licensed technologies have enabled the launch of numerous new businesses that are helping to drive economic growth locally, regionally, and beyond. Additionally, the Laboratory participates in events and organizations that support technology innovation and business development:

- **University partnerships:** LabCorps and the National Lab Entrepreneurial Academy.
- **International partnerships:** The electromechanical battery (EMB) is a potential solution for grid storage applications. Through an international partnership, plans to produce EMBs in California are in development.
- **Industry/non-governmental organizations:** High Performance Computing for Manufacturing – managed by LLNL, the program unites the world-class computing resources and expertise of Department of Energy national laboratories with U.S. manufacturers to deliver solutions that could revolutionize manufacturing.
- **Community partnerships:** The i-GATE innovation hub in Livermore, is a regional partnership to support entrepreneurs, and the Innovation Tri-Valley Leadership Group advocates for the regional innovation ecosystem.
- **Government partnerships:** Laboratory Investor Knowledge Seminar (LINKS) Silicon Valley event helps connect investors to LLNL technology.
- **State partnerships:** California Network for Manufacturing Innovation.

Expanding Partnerships

The Advanced Manufacturing Lab (AML) is a new collaborative hub for developing next-generation materials and manufacturing technologies. The 13,000-square-foot facility is located in LLNL's growing Livermore Valley Open Campus, and features two laboratories (a reconfigurable "wet" chemistry lab and a "dry" instrument lab), a collaboration space, conference area and support rooms with a potential for future expansion.

Expanding on LLNL's existing infrastructure and expertise in materials science, engineering and additive manufacturing, the AML combines high-performance computing, modeling and simulation to rapidly advance research into emerging manufacturing technologies.



The AML enables two-way learning and transfer of technology and capabilities between industry and LLNL.

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